United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

COURT OF APPEALS
DISTRICT OF COLUMBIA
FILED
DEC -5 -1912
Henry W. Hodges
Clerk.

Court of Appeals, District of Columbia

OCTOBER TERM, 1912.

No. 4 Special Calendar
January Term 1913

957

No. 2466.

No. 16 SPECIAL CALENDAR.

CHARLES G. DADE, *Plaintiff in Error,*

vs.

UNITED STATES OF AMERICA.

IN ERROR TO THE POLICE COURT OF THE DISTRICT OF COLUMBIA.

BRIEF FOR PLAINTIFF IN ERROR.

HENRY E. DAVIS,
For Plaintiff in Error.

PRESS OF BYRON S. ADAMS, WASHINGTON, D. C.

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I.

STATEMENT OF THE CASE.

This case was instituted in the Police Court of the District of Columbia by the filing of an information (Rec. 1), charging the plaintiff in error (hereinafter called defendant), with unlawfully offering for sale and selling a certain adulterated article of food, namely, milk, which said food was alleged to be adulterated "in that it did consist in whole and in part of a filthy, decomposed, and putrid animal and vegetable substance," against the provisions of the Food and Drugs Act, so-called. (34 Stats. L., 768.)

The defendant pleaded not guilty, and the cause was tried by the court without a jury. The testimony was taken orally, and is set forth in full in the defendant's bill of exceptions (Rec. 2-27).

A really adequate statement of the testimony would require its reproduction almost in full, but the result of its careful reading will show its essentials to be as follows:

1. *On the part of the Government.*

The milk mentioned in the information was found on analysis to contain 4,500,000 bacteria on ordinary agar, 37° Centigrade, grown for 24 hours, and 89,400,000 bacteria per cubic centimeter. On ordinary agar, 25° Centigrade, grown 48 hours, it contained 83,000 bacteria per cubic centimeter of the colon group. It showed gas fermentation in one-ten-thousandth of a cubic centimeter, approximately 15 drops, and one streptococcus to one-ten-thousandth of a cubic centimeter. (Rec. 2, fol. 3.)

The bacteria are supposed to be of vegetable origin; bacteria themselves are supposed to be vegetable cells. The colon group comes from fermentation in the colon of warm-blooded animals, it is a normal constituent of the colon of all warm-blooded animals; outside of the colon these bacteria come from fæcal contamination (Rec. 2-3). The origin of the colon bacteria is unknown; they have probably been for millions of years on earth, in some form or another; there is no way to trace them back, and it is not known how they get into an animal. (Rec. 3, fol. 4.)

No milk is free from all kinds of bacteria. Milk taken from an absolutely healthy cow under absolutely aseptic conditions would contain very few, if any, bacteria. All market milk has more or less of bacteria in it. There is no way known to scientists to get bacteria out of market milk, except by the use of disinfectants or by sterilization. Sterilization is simply killing the bacteria. The process of sterilization does not drive anything out of the milk, it merely kills the bacteria, which remain in the milk, dead. The effect of the process of the sterilization is to put the bacteria to death, letting them remain in the milk. The same is true of boiling milk (Rec., 3, fol. 5).

The streptococci are associated usually with the colon bacillus in the fæces of the animal, in the intestines of an animal; we find them very often in diseased processes of the animal, diseased intestines, and in human beings, usually in diseased conditions, boils, abscesses, and conditions of that kind. Streptococci are found in boils on human beings, or in abscesses in an animal, and in diseased tissues and intestines. Supposing no colon bacteria present and streptococci only found, one would not say that the latter came from fæcal matter. (Rec., 2-3; 4, fol. 6.)

The colon bacillus is a form of bacteria, very minute in size, that is found almost invariably in fæces from animals. It is found in other places, but it is considered that its original source is from animal fæces, that is, its source as far as we know—not that the fæces generate the bacilli, we know that they grow in the intestines, and that when the fæces are passed out the bacilli may become dried, and you find them in the dust, in the leaves on the street, and you will probably find them in the air of a room. It is the generally accepted view that the intestine is the source of the colon bacillus to this extent, that every examination ever made of the contents of the intestinal canals has demonstrated the presence of B. Coli. The B. Coli is not found elsewhere than in the colon or fæces of the animal, with the exceptions spoken of; it is very generally distributed through nature. As respects the data upon which we rely to say that the colon bacilli that are in a room are traceable to an animal intestine or animal fæces, we know that bacteria do not grow in the air; this we know by experiments that have been made in the laboratory. They are in the dust of a room; assuming some of the dust on the floor gathered and the colon bacillus found present, there is nothing in its appearance or nature which will enable one to say where the bacilli in the room came from. The state of the science is about this: We have been able thus far to find the colon bacillus in animal intestines; thus far we have not been able to find the colon bacillus anywhere else under conditions indicating that it is associated with its place of origin. (Rec. 9-10, fols. 15-16.)

The bacillus is not a part of the intestine any more than a chair in a room is a part of the room; it is a vegetable found in the intestines, and when it passes from the intestines it still continues to be a distinct vegetable organism. (Rec. 13, fol. 22.)

The only source of the colon bacillus that we know is the intestine of warm-blooded animals, that is the place they live. They are taken into the intestine originally with food. They probably come from the fæces of the intestines of other animals; this is talking in a circle. The original source of the colon bacillus is unknown, and the source of the streptococcus is known as is that of the colon bacillus, that it comes from the intestine, and in no other way; it is not thought that anybody could say where these organisms were created or where they originated. It is possible in diseased conditions for the colon bacillus to get into any other part of the animal anatomy from the intestines. If the colon bacillus should start on a journey from the intestine one does not know where it would go; one would not go so far as to say that it could not get into any other part of the anatomy than the colon; one does not know. (Rec. 18, fols. 30-1.) The ultimate source of streptococci is not known any more than that they exist in nature. (Rec. 6, fol. 9.)

The text book of Bacteriology, by Hiss & Zinsser, is an accepted authority on the subject. It is stated in that book as follows:

> "The colon bacillus is a constant inhabitant of the intestinal canal of human beings and animals. It is also found occasionally in soil, in air, in water, and in milk, and is practically ubiquitous in all neighborhoods which are thickly inhabited. When found in nature its presence is generally taken to be an indication of contamination from human or animal sources. Thus, when found in water or milk, much hygienic importance is attached to it. Recently, Papasotiriu and, more independently of him, Prescott, have reported finding bacilli apparently identical with bacillus coli upon rye, barley, and other grains. They believe, upon the basis of this discovery, that bacillus coli is widely distributed in nature and that its presence, unless it appears in large numbers, does not necessarily indicate recent fæcal contamination.
>
> These reports, however, have not found confirmation by the work of others, and cannot, therefore, be as yet accepted." (Rec. 10, fols. 16-17.)

It is also stated by Hiss & Zinsser that "In man, bacillus coli appears in the intestines normally soon after birth, at about the time of taking the first nourishment," which would indicate as to the source of the bacilli that the infant took the bacilli in with its food; very often the finger is put into the baby's mouth to suck. It is also stated by Hiss & Zinsser that "from this time on, throughout life, the bacillus is a constant intestinal inhabitant, apparently without dependence upon the diet." (Rec. 10-11, fol. 18.)

The streptococcus is a form of bacteria, which, instead of being elongated as the colon is, is round, usually arranged in chain formation, one behind the other. By some bacteriologists there are considered to be several varieties of it. (Rec. 12, fol. 20.)

The streptococci may come from various sources; one of the sources is the intestines of warm-blooded animals (Rec. 16, fol. 28).

An examination of 2,000 calves disclosed the presence of colon bacilli in all and of streptococci in all but one. The way that the calves get the bacteria is that the cow usually licks her calf all over, making no distinction as to which end she begins with, and she can contaminate the calf very easily. (Rec. 4-5, fol. 7.) The cow gets the colon bacillus into the calf by physical means, by the tongue. In the first place she licks herself; if the cow has colon bacilli on the tongue, which is the usual case either by licking herself or grazing, it is an easy matter to see that the colon bacillus could be put into the calf's mouth in this way; the cow has had some fæcal matter on her tongue and she transmits it to the calf. The bacillus cannot escape from the cow's colon and reach the cow's tongue; she has to take it into her mouth just as people do. The cow cannot pass on these colon bacilli to the calf. A calf that has not been contaminated by its dam licking it, cannot have these bacilli in the colon. The young animals, immediately on being born, do not have bacteria in the intestinal canal, except when they are born while the mother is diseased, then some of the bacteria are present; a newly-born calf does not have bacteria of the colon group in the colon immediately on birth; immediately after birth, yes, as soon as the mother finishes licking it. That is not the only way in which the colon group bacilli are communicated, they are communicated in the process of birth; the calves cannot get them in any other way than from their mother; they cannot get them from outside; it is supposed that as soon as the calf commences to graze it might get them from outside. The same conditions will probably then obtain as to the cow. (Rec. 6, fol. 10.)

So far as concerns B. Coli being normally present in the intestinal canal, it is simply a condition which science has not been able to eliminate. It has been demonstrated experimentally that bacteria are not at all essential to the processes of animal life. There is no way by which B. Coli can get into the milk before it leaves the cow. There is no instance on record of their being in milk before leaving the cow (Rec. 5, fols. 7-8). In examinations of milk made as it came directly from the cow, no streptococci were found, it is only when it has had an opportunity to become contaminated that they appear at all. If milk were properly handled in cleanly ways, it would rarely, if ever, contain B. Coli or streptococci (Rec. 7, fol. 11).

The colon bacillus is not a normal constituent of milk; the presence of streptococci does not come from the milk at all as it flows from the animal; it is an outside contamination; the presence of colon bacilli and streptococci indicates contamination from an outside source, fæcal contamination (Rec. 2-3, fols. 3-4). B. Coli could not get into milk in any way except through contamination with fæcal matter, but it is possible that streptococci could; the latter might come from a diseased udder (Rec. 17-18, fol. 30). As milk is got from the cow's udder it does not contain bacteria, no cows at all contain them in their udder; they get in after the milk leaves the cow, chiefly from carelessness, from the dust or the air. From experiments of bacteriologists one would say that the colon bacteria come exclusively from animal fæcal matter, in fæcal matter is the only place we have ever been able to get them (Rec. 3-4, fol. 5). These classes of bacilli can get into milk freshly taken from the cow and free from such bacilli, by getting particles of fæces into it. Assuming that the fæces are not placed deliberately in the milk, nobody knows how the bacilli get there; assuming milk to be pure when it leaves the cow, and afterwards discovered containing bacilli, it is a demonstration that the bacilli got into it somewhere from the milk's environment after leaving the cow. (Rec. 13, fol. 23.)

One would not consider the bacteria in question here, the bacilli themselves, a filthy or decomposed vegetable substance. They are just as a potato, and they multiply. You plant a seed, and you get an increased number as a result of multiplication (Rec. 8, fol. 14). One would not say that the colon bacillus is filthy, nobody can say it; one would not say that the streptococcus is filthy, or that either the colon bacillus or streptococcus is decomposed or putrid (Rec. 13, fol. 22).

It is stated by Hiss & Zinsser as follows:

> "The many changes which take place in milk, furthermore, and which add to or detract from its nutritive value, are due largely to bacterial growth and

> have been elucidated by bacteriological methods. Within the udder of the healthy cow, milk is sterile. If pyogenes or systemic diseases of bacterial origin exist in the cow, the milk may, under certain circumstances, be infected even within the mammary glands. In the milk ducts and in the teats, however, even in perfectly healthy animals, a certain number of bacteria may be found. For this reason, even when all precautionary measures are followed, the milk as received in the pail is usually contaminated. As a matter of fact, the anatomical location of the udder and the mechanical difficulties of milking make it practically impossible to collect milk under absolutely aseptic conditions, and, under the best circumstances, from one hundred to five hundred micro-organisms per C. C. may usually be found in freshly taken milk. Withdrawn under conditions of ordinary cleanliness, the bacterial contents of milk are considerably higher than this. After the process of milking, in spite of all practicable precautions, the chances for the contamination of milk are considerable." (Rec. 14, fol. 24.)

The rate of multiplication of these bacilli in milk would depend very largely on the temperature. A very small quantity of these bacilli may get into the milk when it first leaves the teat of the cow, and at improper temperature they would multiply very rapidly. (Rec. 19, fols. 32-3.) As to whether these organisms would be present in pure milk as it comes from the teat of the cow, the first two or three streams taken from the teats of the cow might contain colon organizations, but subsequent streams would not. The reason that the first two or three streams would contain them is because the cow might have been lying down in a field and come in contact with manure of various kinds, her teats might have been wet, and in that way picked up the organisms. They would come from outside contamination of the teat. Contamination of the first streams of milk could be avoided by discarding the milk. (Rec. 15, fol. 26.)

As respects the colon bacillus, Hiss & Zinsser state as follows:

> "Extensive investigations have been carried out to determine whether or not the constant presence of this micro-organism in the intestinal tract is an indication of its possessing a definite physiological function of advantage to its host. It has been argued that it may aid in the fermentation of carbohydrates. The question has been approached experimentally by a number of investigators. Nutthall and Thierfelder delivered guinea-pigs from the mother by Cesarean section and succeeded in keeping them without infection of the intestinal canal for thirteen days, Although no micro-organisms of any kind were found in the fæces of these animals, no harm seemed to accrue to them, and some of them even gained in weight. Schottelius, on the other hand, obtained contradictory results when working with chicks. Allowing eggs to hatch in an especially constructed glass compartment, he succeeded in keeping the chicks and their entire environment sterile for seventeen days. During this time they lost weight, did not thrive, and some of them were moribund at the end of the second week, in marked contrast to the healthy, well-nourished controls, fed in the same way, but under ordinary environmental conditions. Although insufficient work has been done upon this important question, and no definite statement can be made, it is more than likely that the function of the Bacillus Coli in the intestine is not inconsiderable if only because of its possible antagonism to certain putrifactive bacteria, a fact which has been demonstrated in interesting studies by Bienstock and others." (Rec. 11, fols. 18-19.)

As to streptococcus, those authors state as follows:

> "The significance of the presence of streptococci in milk, as an element of danger, has recently received

> much attention in the literature. Heinemann, who has made a careful comparison of streptococcus lacticus (formerly spoken of as bacillus acidi lactici—Kruse),—with other streptococci, has shown that, essentially, this streptococcus does not differ from streptococci from other sources, and is practically indistinguishable by cultural methods from streptococcus pyogenes. Similar comparisons made by Schottmüller, Müller, and others, have led to like results. Since streptococci may be found in milk from perfectly normal cows, and are almost regularly associated with lactic acid fermentation, it is unlikely that these micro-organisms hold any specific relationship to disease." (Rec. 12, fols. 20-1.)

Not all the bacilli of the colon type are noxious. Streptococci may, under certain conditions, be a disease producing variety, and at other times it may not. (Rec. 5, fol. 8.) In form and method of growth on different laboratory media, and where found, the B. Coli is very similar to the typhoid germ, and yet there are distinctive differences between the two; one produces a specific disease, whereas the colon organism or group may set up quite a number of hardly specific diseases, but deviations from normal health, like poison (Rec. 7, fol. 11). Colon bacilli have nothing to do with typhoid itself, you may call it its first cousin. The typhoid bacillus produces typhoid fever, but the colon bacillus does not (Rec. 6, fol. 10). There are a great many kinds of bacteria; there are lots of kinds that have not been identified. Some bacteria are harmful and others are not.

As to the milk in question being filthy or decomposed, one would consider the milk to have been dirty; that the milk, especially on account of the large number of bacteria found, originally contained fæces, and therefore was filthy;

that the growth of bacteria inevitably results in the decomposition of the substance in which they grow; that the milk itself was in whole or in part decomposed; that milk is an animal substance and bacteria are a vegetable in milk, and as a result of the growth of them in milk the milk becomes a decomposed substance. (Rec. 8, fol. 13.) Generally speaking, by a substance being decomposed, is meant a substance that is split up into some of its elements; of course, it is no longer the same substance; in the sense of splitting up or decomposition such milk is decomposed (Rec. 12, fol. 21). The presence of 83,000 B. Coli and 10,000 streptococci in one cubic centimeter of milk would indicate that the milk was in a filthy condition; it would indicate decomposition (Rec. 15, fols. 25-6). When bacteria die they decompose, and, of course, they die in milk after they have lived out their course. The bacteria of these two classes effect decomposition of certain products of the milk. One of the most evident decompositions is the decomposition of the milk sugar, which is broken up into various gases, and acids, and possibly other products. Standing alone bacteria could be considered a decomposed organism, that is after they are dead; the live bacteria would not be decomposed. The ones counted are alive, the dead ones cannot be counted; but the fact that there are live ones there is a very good evidence that there are dead ones also, because their life is very short. One would not say that the live B. Coli cells are filthy, putrid, or decomposed. (Rec. 16, fol. 28.) Decomposed milk is milk in which one or more of its constituents have been broken up into constituent parts. It would be deteriorated, certainly. Sour milk is a form of decomposed milk, that is one of the results of the action of bacteria. The decomposition of milk sugar into lactic acid is the process that causes milk to sour. (Rec. 18, fol. 32.)

A milk dealer having a quantity of milk in a receptacle, and wishing to take the precaution of seeing that that milk did not get on the market containing an improper quantity of bacteria, would have to have it analyzed; it would take about 24 hours anyhow to determine whether the milk contained the suspected bacteria which were the object of the search. (Rec. 13, fol. 23.)

2. *On the part of the Defendant.*

The colon bacillus is a minute cellular organism devoid of coloring matter. The particular place it is found is the intestinal tracts of all animals; it is found in the water, air, soil, and is sometimes considered, or practically considered, ubiquitous. As distinguished from its habitat, nobody knows the source of the colon bacillus. It was first identified in 1906 by Escherich. It is practically ubiquitous.

The colon bacillus finds its way from the intestinal tract of the animal into the outer air by the anus, in the excreta or dejecta, as they are variously called. This bacillus is encountered elsewhere than in fæcal matter, It is found in water.

One would not consider the colon bacillus unclean or decomposed; an ordinary colon bacillus that is alive is not putrid. This bacillus is a living organism, it is matter. The colon bacillus is found in man as well as in brute; it is found in the dog. As respects the age in man at which this bacillus is found generally, it has been found in infants; in fact it was first discovered by Escherich in an infant, which was fed from the breast.

The streptococcus is the name, as the name signifies, of a coccus, which is a round organism, and grows in the form of a chain, there is one coccus on another. It is a vegetable, the same as the colon bacillus. There are quite a number of varieties of the streptococcus, the two particular varieties are the streptococcus pyogenes, and streptococcus erysipelatis; there is also one found in milk, the streptococcus lacticus. The erysipelatis is found in people suffering particularly from erysipelas. The pyogenes is found in what is known as blood-poisoning, one form of blood-poisoning. The lacticus is found on the skin of cows and healthy animals. To all intents and purposes they are alive. The streptococcus is not, per se, unclean, or decomposed, or putrid. The colon bacillus or the ordinary streptococcus is non-pathogenic, that is, it does not produce disease. With reference to bacteria in general, there are classes of bacteria which are actually helpful to man, Lacticus Bulgarius, for instance. Milk contains bacteria in that one form. We put that in milk and it corrects quite a number of intestinal disorders. It is also fed to the patient itself for gastric troubles. As to whether bacteria have any effect in counteracting or destroying the putrifactive or other obnoxious kinds of bacteria, some germs are often antagonistic to others.

Bacteria feed on animal substances generally, as, for instance, the peptones and salts. Being antagonistic, they would live on one another. The work by Hiss & Zinsser has been found one the best textbooks of the present age; it is used by the majority of colleges. The work "General Bacteriology," by Jordan, is scientifically regarded as an authority.

According to the best authorities, milk taken aseptically from the cow will have from 200 to 400 bacteria to the cubic centimeter. The incubation of these germs is very rapid in suitable media and at proper temperature. It is practically impossible to collect milk freshly from the cow that is free from the presence of germs or bacteria.

The effect of the process known as the Pasteurization of milk is that it kills all the non-spore-bearing organisms. It does not eject them from the milk, it leaves them there dead, so that Pasteurized milk, when it is offered for sale, contains in it any bacteria which were in it when it was subjected to the process of Pasteurization; the same is the case with reference to the process of boiling.

The colon bacillus will live in distilled water for a few hours. It gets into the distilled water by being put there a pure culture; a pure culture is one that contains only one kind of organism.

One would not term a large quantity of this particular kind of bacteria unclean. One would not consider germs unclean. The streptococcus erysipelatis has relation to the germ of erysipelas; then you have one of blood poisoning, the pyogenes. There are different forms. One of them is pathogenic, or disease-producing, and the other is not. The one called lacticus is not. One would not call the streptococci a part of the milk. Milk itself is an animal substance and not a vegetable. As to streptococci being found in the air, where there is dust there are more of them, just like after a room is swept you find more germs in the air than when it is not. If milk is taken in a proper environment the bacillus would not be so apt to multiply. If held at a proper temperature, it would not, but at an improper temperature it would. One would not say that they all come from fæces; they are found in fæces. If you took a piece of fæces and dropped it into the milk you would have a larger number than if you had just left it to the air, of course.

As to where the streptococci found in the same product in connection with B. Coli come from, one would say that the organism is generally found on the skin of the cow; where it got into the sample of the milk one would not know, would not like to say in any particular sample where it came from; a puff of wind might have blown fæcal matter into the milk. The streptococcus fæcalis is found in the intestine of cows, sometimes, and in human beings, that is another variety. The streptococcus does not necessarily come from a diseased condition; you find the streptococcus lacticus on absolutely healthy cows; nobody knows where it comes from—no germs for that matter; it is just like saying that the whole nation of people come from one source. We find the streptococcus pyogenes in blood-poisoning and the erysipelatis in erysipelas; the lacticus we find on the udder of cows, the fæcalis are found in our own stools.

It is not well recognized in the profession that fæcal matter is the only place that the B. Coli comes from; it comes from such and other places too, soil, water, air, and by some it is considered to be ubiquitous, meaning it is found in every place. We do not know how it gets there or where it comes from. It is not so that the learning of the profession has resulted in finding that the source, so far as it can be traced, is the intestinal tract of animals, and that from that intestinal tract it is distributed in various places through the fæcal matter; inasmuch as the colon bacillus can be carried by water, and water is in every place, it certainly can be in every place, but we do not say that fæcal matter is the cause. It is not a fact that all of the authorities hold that it does indicate contamination, Jordan saying it is ubiquitous.

As to streptococci and B. Coli, one does not know that they are harmful, they are non-pathogenic. Some of the saprophytic would attack the others.

The life of B. Coli depends upon the circumstances; it derives its nutriment from the media of milk, for instance. As respects the condition produced by organisms in milk, the various tests which the samples are put through do not show the absolute result, we do not know the chemical result; as respects the bacteriological result, some milks coagulate, some form acids. The character of the milk is changed; as ordinarily understood, decomposition changes the character of the milk-decomposition, and makes it rotten. In taking in nutriment, some of the organisms eventually give off certain products, discharges; what becomes of those discharges all depends on what they are; they remain there; whether they act on the substance of the milk is left to the chemist. One does not know whether the B. Coli or the streptococci destroy any disease-producing organisms. No germ improves the quality of milk. The reason the germ dies in distilled water is because it gets no nutriment. (Rec., 20-23.)

B. Coli have been found in milk got from a cow and inoculated at the place at once. In one sample on the first milking of one cow, when no precautions were taken, about 300,000 bacteria to the cubic centimeter were found, just taking the number, not the kind; in another the milker simply washed his hands, and in that were found a little over 100,000; in the next one the udder was washed and the hands of the milker scrubbed, and in that were found between 15,000 and 20,000. In the last case no streptococcus lacticus was found, but the B. Coli were found in each and every specimen. The test showed that one ought to be more cleanly but that one could not do away with the bacteria altogether.

In only a limited sense is the colon bacillus ubiquitous. It is found by far most abundantly and constantly in the intestinal tract of man and many of the higher animals. It is found in the air, soil, and water. It is generally considered non-pathogenic. Some authors hold that it is non-pathogenic, and some that it is feebly pathogenic.

Jordan states as follows:

> "It is well established, however, that under some conditions the colon bacillus is able to pass from the digestive tract into the blood, whence it may invade the gallbladder and bile ducts and cause cholangitis and cholecystitis. Convincing evidence on this score has been obtained both from human pathology and from animal experiment. The bacillus is often found in the core of gall stones. Kramer has made the interesting observation that in cultures the colon bacillus (and the typhoid bacillus) can precipitate cholesteri and other biliary constituents and hence may take an important part in gall stone formation."

This does not go far enough; it does not say whether the colon bacillus was the cause of getting into the bile duct. If the tract is intact, it will not go through there, some other cause leaves an opening for it to get through.

As to whether it is a fact that all authorities agree that it is fæcal contamination that causes the presence of B. Coli in water, observation has shown that this is not always so.

The statement from Jordan that "it is well established, however, that under some conditions the colon bacillus is able to pass from the digestive tract into the blood, whence it may invade the gall bladder, and bile ducts, and cause cholangitis and cholecystitis," indicates that the bacillus gets into the blood before it leaves either the gall bladder or bile duct, and if in the blood, of course, it can go through the whole system.

It is not necessarily so that the presence together of the colon bacillus and the streptococcus in the same article or substance indicates that they come from a common source. (Rec. 23-24.)

The milk of the cow is an animal substance. It has a good many chemical constituents, the particular ones being the fat, the casein, water and certain salts. The presence of streptococci in milk would have no effect upon the decomposition of fresh milk In the ordinary acceptation of the term as applied to food products, decomposition would mean a change towards putrification, and putrification is the decomposition of vegetable or animal matter with the evolution of foul smelling odors. As applied in chemistry to ordinary substances, decomposition would be simply the separation of the substance into its elements. Decomposition of milk by various bacteria might produce, under certain conditions, the separation of the milk sugar into its elements, changing it to lactic acid; there would be a separation and a building-up process going on at the same time. As to the separation process, the milk sugar would be changed, changing a part of its carbon, being reduced in carbon, hydrogen and oxygen, and being changed into a different form, a different chemical combination of the elements; the building-up process would be the same thing, it would be the changing from one form of constituents to another. If that continues the milk would gradually sour; up to the point of souring, there would be no effect, the constituents of milk would be there, it would be changed from sweet milk to sour milk; in other words, there would be a certain amount of the milk sugar which had been converted into lactic acid. Any chemical deterioration would be involved only in that respect, that is, the change from that form to another; the ingredients change in that respect during the souring process. There is no such thing possible as sweet milk being putrid.

Assuming the presence of fæcal matter in milk, it can be discovered, it can be filtered out, or at least the residuum of it may be filtered out. The effect of the process known as the Pasteurization of milk on germ life of milk is to kill the majority of the germs. They remain in the milk in a dead state; whereas before they were alive, the process of Pasteurization simply kills them and leaves them in. The same thing happens in boiling; milk containing germs alive, upon being boiled, contains the same germs dead.

As soon as milk is exposed to the air it begins to undergo a souring process. How long milk can ordinarily be kept sweet, after being taken from the cow, depends on the temperature at which it is kept; if it is kept at a low temperature, it can be kept for quite a while, several days, but if the temperature is at all high, it is likely to sour within 10 or 12 hours after milking.

The definition of the word "decomposition" is given from two standpoints; decomposition as referred to food products is similar to putrification; decomposition from a chemical standpoint, independent of food products, and taken in a different sense, has reference to the separation of a compound into its elements, so that the presence of bacteria causes decomposition in a chemical sense. It is universally known that decomposition when applied to food products means a putrifactive change.

From a chemical standpoint, bacteria of the colon group do not produce any poisonous substances in the milk. They would coagulate it. So far as the chemical knowledge of the subject is concerned, it would not tell us whether it did or not; we would have to depend on the bacteriological test on that.

The distinction between decomposition and putrification is that putrification is always accompanied by an evolution of disagreeable odors, decomposition may or may not be. That is the only distinction so far as the general term goes. In putrification, we have the term as applied to nitrogen products; in decomposition it may be applied to either nitrogenous or non-nitrogenous products, or both. There is a marked distinction between the terms. Putrification would ordinarily mean decay, rottenness. Decomposition does not mean that. The rotten apple is a decomposed apple, decomposition may or may not involve the rottening process. Decomposition means spoiled or decayed. Sour milk has a smell, but not disagreeable; there we have changing or decomposition in the form of the change of one product into another; the distinction is as to whether the smell is agreeable or disagreeable so far as putrification is concerned. (Rec., 24-26.)

3. *On the part of the Government in rebuttal.*

Decomposition may mean putrification; putrification is the end of or last product of the bacterial action on its food, so that it passes through the stage of decomposition into the putrifactive state. Putrification is always traceable to bacterial action, decomposition not necessarily so. (Rec., 26-7.)

At the close of the testimony the defendant moved the Court to adjudge upon the record and testimony that he was not guilty as charged, and that he accordingly be discharged without day, upon the following grounds:

1. The Act of Congress of the United States, under which the information herein is brought, has no application to such a case as that disclosed by the testimony, namely, the case of a natural product or substance, to wit, milk, containing only natural organisms, to wit, bacteria, entering therein in natural and normal course and manner, and under natural and normal conditions, and without human design or purpose, or independent or intentional human act.

2. The presence of such organisms in such product or substance does not cause the latter to consist, either wholly or in part, of a filthy, decomposed or putrid animal or vegetable substance, within the meaning of said Act.

3. No one of the said organisms is in itself filthy, decomposed or putrid, within such meaning.

4. The testimony fails to disclose that the product or substance mentioned in the information and testimony, to wit, the milk therein mentioned, consisted, either wholly or in part, of a filthy, decomposed or putrid animal or vegetable substance, within such meaning.

5. The testimony fails to disclose that any one of the said organisms was a filthy, decomposed, or putrid animal or vegetable substance, within such meaning.

6. The testimony fails to establish or to disclose an offence under the said Act of Congress, or any offence whatsoever in law. (Rec. 27.)

But the court overruled the defendant's said motion and adjudged him to be guilty as charged, and the defendant duly excepted and sued out a writ of error, which was granted.

II.

ASSIGNMENTS OF ERROR.

The court below erred as follows:

1. In holding that the Act of the Congress of the United States approved June 30, 1906, commonly called the Food and Drugs Act, has application to the case of a natural product or substance, to wit, milk, containing only natural organisms, to wit, bacteria, entering thereinto in natural and normal course and manner, and under natural and normal conditions, and without human design or purpose. or independent or intentional human act;

2. In holding that the presence of such organisms in such product or substance cause the latter to consist, wholly or in part, of a filthy, decomposed or putrid animal or vegetable substance, within the meaning of the said Act:

3. In holding that any one of the said organisms is in itself filthy, decomposed or putrid, within such meaning;

4. In holding that the testimony disclosed that the product or substance mentioned in the information and testimony, to wit, the milk therein mentioned, consisted, either wholly or in part, of a filthy, decomposed or putrid animal or vegetable substance, within such meaning;

5. In holding that the testimony disclosed that any one of the said organisms was a filthy, decomposed or putrid animal or vegetable substance, within such meaning;

6. In holding that the testimony established or disclosed an offense under the said Act of Congress, or any offence whatsoever in law. (Rec. 28.)

III.

ARGUMENT.

The assignments of error, though six in number, may be grouped and will be considered as follows:

A. The Food and Drugs Act, so-called, has no application to the case at bar.

B. The testimony fails to show that the article under inquiry, to wit, the milk mentioned in the information, consisted in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance within the meaning of the said Act.

A.

The Food and Drugs Act, So-Called, as no Application to the Case at Bar.

1. The provision of the Food and Drugs Act, under which the information was brought, is as follows:

> "Sec. 7. That for the purposes of this act an article shall be deemed to be adulterated * * * in the case of food * * *
>
> "Sixth. If it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter" (34 Stats. at L., 769, 770).

And the case rests upon so much of the foregoing provision as declares an article of food to be adulterated "if it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance."

Section 7 of the act defines adulteration in the cases of drugs, confectionery, and food, respectively, as follows:

In the case of drugs, (1) if when sold under a recognized name, it differs from the recognized standard of strength, quality, or purity, or (2) if its strength or purity fall below the professed standard or quality under which it is sold.

In the case of confectionery, if it *contain* terra alba, etc., "or other ingredients deleterious or detrimental to the health," etc.

In the case of food, (1) if any substance has been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength; (2) if any substance has been substituted wholly or in part for the article; (3) if any valuable constituent of the article has been wholly or in part abstracted; (4) if it be mixed, colored, etc., in a manner whereby damage or imperfection is concealed; (5) if it *contain* any added poisonous or other added deleterious ingredient, which may render such article injurious to health, and (6) if it *consists* in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, etc. (34 Stats. at L., 769, 770).

It is to be noted that as to drugs, adulteration consists in difference from standard, which means that the article is other than what it purports to be in strength, quality, or purity: not that it contains anything foreign to its character or consists wholly or in part of any other ingredient or constituent not properly part of the article, but only that, in respect of its ingredients or constituents or some of them or the composite resulting from their being put together, it is not of the character which it professes to be in the particulars mentioned; that as to confectionery, adulteration consists in its containing something not properly an ingredient or constituent of confectionery, but something added, something of which confectionery itself does not consist; and that as to food, adulteration consists in (1) mixing or packing with it some substance injuriously affecting its quality or strength; (2) substituting for it some substance wholly or in part; (3) wholly or in part abstracting from it any valuable constituent; (4) concealing damage or imperfection of the article by mixing, coloring, etc.; (5) if it *contain* any *added* ingredient rendering it injurious to health, or (6) if it *consists* in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance—that is to say, if any ingredient or constituent of the article itself is filthy, decomposed, or putrid: not if some such substance not part of the article itself has been added to it so as to be found *contained* within it.

Throughout these several provisions of the act defining adulteration it is obvious that there runs a clear distinction between the adulteration which consists in *adding* to an article that which is properly not part of it—that is to say, making the article *contain* something which does not belong to it—and the adulteration existing when some part of the article itself is not what it ought to be—that is to say, when some part of the article, whether animal or vegetable *is* filthy, decomposed, or putrid—not that the article *contains* a substance of that character foreign to its proper ingredients or constituents.

Whether such might have been within the intention of Congress, there is certainly in the act nothing denouncing, as adulterated, a natural product or substance containing only matter entering or found therein in natural and normal course and manner and under natural and normal conditions, and without human design or purpose or independent or intentional human act. And this is not to deny that the act forbids the selling or offering to sell an article any natural part or constituent of which has become filthy, decomposed, or putrid, for such is just what the act does forbid.

Also, it is not every content of an article other than some ingredient or constituent of itself that is defined by the act to be adulterated—*inclusio unius est exclusio alterius*—and finding as we do in the act some such contents as the act declares to constitute adulteration, we may not go beyond the limits of the act and import into its purview other contents as such.

Again, when, as in the case of the act under consideration, different words are industriously used, they must be given the meanings obviously within the contemplation of the legislature; and finding in several parts of the act the word *"contain,"* and only in the one part under immediate consideration the words *"consists of,"* it is inevitable that the words are used with different meanings and are to be read accordingly.

By the Standard Dictionary the word "consist" is defined as follows:

> "1. To be composed or constituted; made up: followed by *of*. 2. To have as its foundation, substance, or nature; be: followed by *in*. Prepositions: *of* (to indicate the materials or components); as, granite consists *of* quartz, feldspar and mica; *in* (to denote the substance or essence); as, true charity does not consist *in* almsgiving."

By the Century Dictionary the word is defined as follows:

> "3. To abide; rest, be comprised, contained, performed, or expressed: followed by *in*. 4. To be composed; be made up: followed by *of*."

By the former dictionary the word "contain" is defined as

> "to have for its contents; hold; enclose; include."

And by the latter dictionary the word is defined as

> "to hold within fixed limits; comprehend; comprise; include; hold. * * * 3. To comprise, as a writing; have as contents."

Webster's New International Dictionary gives like definitions of the two words, and respecting the former says:

> "The verb *'consist'* is employed chiefly for two purposes, which are marked and distinguished by the prepositions used. When we wish to indicate the parts which unite to compose a thing, we use *of.* * * * When we wish to indicate the true nature of a thing, or that on which it depends, we use *in.*"

It is, of course, conclusively to be presumed that Congress in using the words in question used them in their accepted meanings, and both these meanings and the discriminating provisions themselves in the act in defining adulterations of food would seem to make it clear that the provision of the act under which the libel was brought is to be considered as though it read, "If it" (*i.e.,* the article itself) "is, in whole or in part, filthy, decomposed or putrid."

The language of the rest of the paragraph, of which the provision is part, puts this beyond possibility of discussion. "Any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter," is not language used of the contents of an article: it is language used of an article in respect in its ingredients or constituents. Thus read, the whole of the paragraph under consideration is consistent throughout in itself, and is in keeping with the remainder of the section of which it is part, the object of which section is to define, with discrimination, the various kinds of adulteration within the meaning of the act.

2. The presence in milk of bacteria does not, within the meaning of the act, cause the milk to consist, in whole or in part, of the bacteria; the bacteria are only contained within the milk, of which they are not constituents or ingredients.

The testimony is clear and harmonious to the fact that the bacteria in question are no part of the milk itself; that they are intruders into the substance, within which they may remain, either alive or dead, without in any sense or in any wise becoming part, constituent or ingredient of the substance. They are foreign invaders who might be expelled without in any, the slightest, degree changing the substance in any one of its constituents or ingredients; the substance therefore *contains* them without *consisting* of them. Whether they are in themselves "filthy, decomposed or putrid" is not at the moment under consideration: the point at present is that they are not within the meaning, scope or contemplation of the provision of the act under notice.

Assume for a moment milk in which are found sundry grains of wheat, a not unlikely case. Surely in such case it would not seriously be contended that the milk *consisted of* wheat, either in whole or in part. It may well be admitted that milk and grains of wheat should not be sold together as milk, but such can not alter the fact that neither the milk nor the wheat *consists of* the other. Nor in such case could it be successfully contended that, within the meaning of the provision of the act in question, the milk is adulterated by the mere presence therein of the wheat. So, the mere presence in milk of bacteria can not be said to constitute adulteration of the substance, whether within the meaning of the provision or in common parlance.

B.

The Testimony Fails to Show That the Milk in Question Consisted, in Whole or in Part, of a Filthy, Decomposed or Putrid Animal or Vegetable Substance.

1. There is no contention nor pretence that the milk itself, or any of the bacteria contained within it, was in any sense putrid.

2. As respects filth, the only testimony on which the Government can rely is that of one witness who said that the milk was filthy by reason of containing organisms *coming from* dung or fæcal matter, and secondly, on account of the *excessive* number of bacteria (Rec., 4, fol. 6), and of another who said that it was filthy for that, on account of the large number of bacteria found, it *originally* contained fæcal matter (Rec., 8, fol. 13.)

a. The contention that an organism is filthy because having its origin in filth is untenable; so much so as to be negligible. As well say that ammonia coming from horse manure is filthy because of its source.

b. The contention that because the bacteria in question originate under conditions of fæcal association there must have been fæcal matter in the substance in which they are found is no more tenable

In the first place, it is not scientifically, much less practically, established that the bacteria in question originate under conditions of fæcal association only. (Rec., 20, fol. 34; 22, fol. 38.)

In the next place, the bacteria in question are found wholly without fæcal association, as in soil, air and water, and on various kinds of grain (Rec., 9, fols. 15-16; 10, fols. 16-17; 20, fol. 34), and they live outside of and apart from any supposed fæcal association (Rec., 18, fol. 31; 20, fol. 34; 21, fol. 36); wherefore it is impossible to say that because the bacteria are found in a given substance, that substance must at some time have contained fæcal matter.

c. The contention that the bacteria have any relation to filth is not only untenable, it is also in the direct face of all the testimony on the point They are not in themselves filthy, "nobody can say" that they are (Rec., 8, fol. 14; 13, fol. 22; 16-17, fol. 28; 20, fol. 35; 21, fol. 37), and there is no pretence that they are filth-generating or filth-producing in any sense.

3. Nor is there any force in the contention that either the milk in question or any of the bacteria within it was decomposed within the meaning of the act.

It is important, in the outset, to ascertain the meaning of this word "decomposed," as used in the act, and for this we have a simple and clear guide.

The maxim, *Noscitur a Sociis,* while not a rule to be resorted to when the meaning of words does not require construction, is yet a recognized guide to statutory construction when such is found necessary. "You may know a person by the company he keeps. You may know the meaning of a term by its associates—what precedes and what follows it. When? Not in every case, but when not apparent from the language itself."

Brown v. Chic. & N. W. R. Co., 102 Wis., 137.

Without being quoted in terms, the maxim was applied by the Supreme Court of the United States in construing the Bankruptcy Act of 1841, in the following manner. By the terms of the Act, the existence of a fiduciary debt, contracted before the passage of the Act, constituted no objection to the discharge of the debtor from other debts, and the question arose whether a factor receiving the money of his principal was a fiduciary within the meaning of the Act. The Court answered this question thus:

> "The second point is, whether a factor, who retains the money of his principal, is a fiduciary debtor within the act.
>
> If the act embrace such a debt, it will be difficult to limit its application. It must include all debts arising from agencies; and indeed all cases where the law implies an obligation from the trust reposed in the debtor. Such a construction would have left but few debts on which the law could operate. In almost all the commercial transactions of the country, confidence is reposed in the punctuality and integrity of the debtor, and a violation of these is, in a commercial sense, a disregard of a trust. But this is not the relation spoken of in the first section of the act.
>
> The cases enumerated, 'the defalcation of a public officer,' 'executor,' 'administrator,' 'guardian,' or 'trustee,' are not cases of implied, but special trusts, and the 'other fiduciary capacity' mentioned, must mean the same class of trusts. The act speaks of technical trusts, and not those which the law implies from the contract. A factor is not, therefore, within the act."
>
> Chapman v. Forsyth, 2 How., 202, 208.

In a subsequent case arising under the Bankruptcy Act of 1867, the same high authority again applied the maxim, this time by name. In this case the Supreme Court of Appeals of Virginia had construed the word "fraud" in the act as including any and every kind of fraud, whether positive fraud, that is fraud in fact, or implied fraud, or fraud in law. In reversing the State court, and holding that the word "fraud" in the act contemplated positive fraud, or fraud in fact, only, the Supreme Court of the United States, after quoting from Chapman v. Forsyth, as above, said:

> "A like process of reasoning may be properly employed in construing the corresponding section of the Act of 1867. It is a familiar rule in the interpretation of written instruments and statutes that 'A passage will be best interpreted by reference to that which precedes and follows it.' So also, 'The meaning of a word may be ascertained by reference to the meaning of words associated with it.' In Broom, Leg. Max., p. 523, it is said: 'It is a rule laid down by Lord Bacon, that *copulatio verborum indicat acceptationem in eodem sensu,* the coupling of words together shows that they are to be understood in the same sense. And where the meaning of any particular word is doubtful or obscure, * * * the intention of the party who has made use of it may frequently be ascertained and carried into effect by looking at the adjoining words.' The same author says (p. 528): 'In the construction of statutes, likewise, the rule, *noscitur a sociis* is very frequently applied; the meaning of a word and, consequently, the intention of the Legislature, being ascertained by reference to the context, and by considering whether the word in question and the surrounding words are, in fact, *ejusdem generis,* and referable to the same subject matter.'"
>
> Neal v. Clark, 95 U. S., 704, 708-9.

And the principle of the maxim was applied still later in the case of

Hennequin v. Clews, 111 U. S., 676, 679.

The maxim itself is thus rendered by Broom:

> "The meaning of a word may be ascertained by reference to the meaning of words associated with it."

But the instances of its application cited by that author show that, as often as not, the maxim *requires* the meaning of a given word thus to be ascertained. For example, he cites the following:

> "In a very recent case a testator, after disposing of certain real estate, gave all the rest of his 'household furniture, books, linen, and china (except as hereinafter mentioned), goods, chattels, *estate,* and effects, of what nature or kind soever, and wheresoever the same shall be at the time of my death,' to certain executors in trust to sell; and on a special case stated for the opinion of the Court, it was held, that the testator's real estate did not pass by the above words; for although the word 'estate' is sufficiently comprehensive to include real property, yet this *prima facie* meaning may be cut down or explained by the context, and where the word in question is associated with other words indicating personalty only. The Court observed, that, in the case before them, the word 'estate' could not have been used as *nomen generalissimum,* because it appeared from other portions of the will not to have been used as including *all* the personal property of the testator; that it was, consequently, necessary to give it some more limited meaning than that which would *prima facie* have been assigned to it, and that such meaning could only be ascertained by applying to the maxim *noscitur a sociis,* and holding that the word had reference exclusively to matters of the same nature as those whereto the words related with which it was associated."
>
> Broom (Fourth Edition), p. 377.
> Sanderson v. Dobson, 1 Exch., 141.
> Doe v. Earles, 15 M. & W., 450.

Applying the maxim to the case at bar, it is seen that the word "decomposed" in the Food and Drugs Act must be given a meaning kindred with the meaning of the words with which it is directly associated, namely, "filthy" and "putrid."

The three several words are thus defined:

By the Standard Dictionary:

Filthy.—Of the nature of or containing filth; dirty; nasty. (Filth. Anything that soils or makes foul; that which is foul or dirty; also the state or quality of being foul; nastiness; dirt.)

Decomposed.—In a state of decomposition; decayed; rotten. (Decompose. 1. To resolve into constituent parts or elements, as by means of chemical agents or natural decay; especially, to cause to decay or rot. 2. To become separated into elements; hence, to putrefy; decay; rot.)

Putrid.—Being in a state of putrefaction; tainted; as putrid flesh.

By the Century Dictionary:

Filthy.—Containing or involved in filth; foul; noisome; nasty.

Decomposed.—In a state of decomposition. (Decomposition. 1. The act or process of separating the constituent elements of a compound body or substance; analysis; resolution; specifically, the process of reducing an organic body to a state of decay or putrefaction. 2. The state of being decomposed or resolved; release from previous combinations; disintegration; specifically, decay of an organic body.)

Putrid.—In a state of decay or putrefaction; exhibiting putrefaction; corrupt; fetid from rottenness; stinking; said of animal or vegetable substances; as, putrid flesh.

By Webster's New International Dictionary:

Filthy.—Defiled with filth, whether material or moral; nasty; disgustingly dirty; polluting; foul; impure; obscene.

> Decomposed.—Subjected to decay; in a state of decomposition. (Decomposition. Act or process of decomposing, or state of being decomposed; separation into components; specifically, decay or dissolution).
>
> Putrid.—1. Tending to decomposition or decay; decomposed; offensively or stinkingly rotten; said of animal or vegetable matter; as putrid flesh. 2. Indicating, or proceeding from, a decayed state of animal or vegetable matter; as, a putrid smell.

Very clearly, the word "decomposed" in the statute has not the meaning of resolution into elements, either total or partial, but has the meaning, and that only, of something akin to "filthy" or "putrid." Neither of these latter words has any reference to the presence or absence of bacteria, which in themselves are not filthy or decomposed vegetable substance (Rec. 8, fol. 14; 13, fol. 22; 16-17, fol. 28; 20, fol. 35; 21, fol. 37); each of the words has reference to unfitness for consumption, because dirty (nasty), or rotten.

"Decomposed," the middle word of the three, must, accordingly, be given a meaning having kinship with the meanings of the other two, its fellows; which meaning can only be, deterioration from the normal, of the nature, or in the direction, of filthiness or putridity; and the word as used in the statute can, therefore, have no reference to either mere chemical change or the presence or absence of bacteria.

The only sense in which any one of the witnesses used the word "decomposed" or "decomposition," as applied to the milk in question, is the sense of chemical separation, resolution, or splitting up into constituents or elements; and all are practically agreed that as ordinarily understood the word "decomposed," as applied to food products, means rotten, or in a changed condition, of the nature, or in the direction, of rottenness or putrifaction (Rec. 3, fol. 4;

8, fols. 13-14; 12-13, fols. 21-2; 16, fol. 28; 18, fols. 31-2; 23, fol. 39; 24-5, fols. 42, 44; 26, fols. 45, 46); except that one of the witnesses said that when bacteria die in milk they decompose (16, fol. 28), apparently meaning that they decay, but all of the testimony shows that this is mere conjecture, as also it shows that the effect of the Pasteurization and boiling of milk—supposed to be highly beneficial processes—is to kill the bacteria and leave them in the milk, dead.

It is accordingly confidently submitted that, within the meaning of the Act under consideration, "decomposed" can not be predicated of either the milk in question or the bacteria said to have been found within it.

In the Frozen Egg Product Case, so-called, lately under consideration by the Supreme Court of the United States, but which went off on a jurisdictional point (October Term, 1912, No. 590), counsel for the claimants so fully and well stated and considered certain facts regarding bacteria of the sort under consideration, that no apology is deemed necessary for repeating herein the following portion of counsel's main brief. The scientific statements cited are of those recognized on all sides as authorities in their calling, and the testimony of such of them as is referred to was given in a case to which the defendant in error herein was party; so that, apart from its value as contributing to the discussion in the premises, it is free from the imputation of being *ex parte*.

"The following facts regarding bacteria are, we think, everywhere recognized as true by scientists.

"Bacteria are single-cell microscopic, vegetable organisms found in all organic matter and on inorganic matter, in air, water and soil, everywhere, in enormous numbers.

"Burnet, Microbes and Toxins (1912), p. 55:

"Microbes are of all living creatures the most widespread. They exist wherever there is organic matter" (p. 50). "The term 'microbes' in current language most frequently signifies bacteria. * * * Scattered as they are throughout nature the bacteria are the chief agents in the decompositions and recombinations of organic and living matter."

"Prescott and Winslow, Water Bacteriology (1908), p. 1:

"Bacteria are the most numerous and the most widely distributed of living things. They are present not merely at the surface of the earth or in the bodies of water which partially cover it, as is the case with most other living things, but in the soil itself and in the air above, and in the waters under the earth."

"They are almost infinitesimally small and they are present almost everywhere in enormous numbers. Thus Prof. Jordan testified that he could get on the point of a needle probably several hundred thousand and possibly several million (p. 205); and it has been estimated that five hundred million average bacteria would be equal in bulk to one ordinary grain of sugar. Dr. Pease testified that it was doubtful whether a million could be seen with the naked eye (p. 200).

"Conn, Agricultural Bacteriology (1901):

"In size they (bacteria) are inconceivably minute, being by far the smallest living organisms known and demanding the highest powers of the microscope for their study" (pp. 24, 25). "Normally ripened cream usually has from 300,000,000 to 600,000,000 bacteria per cubic centimeter," but samples run as high as 1,500,000,000 (p. 226).

"Dr. Heinemann, 'Cold Storage Problems,' Popular Science Monthly for August, 1912, says that 'millions of bacteria take up a smaller space than the head of a pin' (p. 156).

"Bacteria under proper conditions multiply with almost inconceivable rapidity. They divide by fission into approximately equal halves, the division often taking place as frequently as once in each quarter hour or half hour (Dr. Stiles, p. 98).

"Jordan, General Bacteriology (1908), p. 61:

> "It has been estimated that if bacterial multiplication went on unchecked, and the division of each cell took place as often as once an hour, the descendants of each individual would in two days number 281,500,000,000, and that in three days the progeny of a single cell would balance 148,356 hundredweight!"
>
> An actual test upon samples of milk showed that in twenty-four hours 3,000 bacteria increased to 25,000,000,000 (Savage, Milk and the Public Health (1912), p. 48), and in experiments with ripening cream the bacteria increased from 44,000 to 1,300,000,000 (Conn. Agricultural Bacteriology (1901), p. 226). Dr. Pease testified that in experiments made with eggs he had found that in twenty-four hours 500,000 bacteria increased to 20,000,000 (pp. 194, 199, 202).

"Most bacteria are useful and beneficial; only in exceptional cases are they injurious or pathogenic to man or to living animals. It has been said that bacteria in this respect are like humans; there are some thieves and cutthroats, but most are useful, law-abiding citizens.

"Encyclopædia Britannica, 'Bacteriology,' 11th Ed., Vol. III, p. 164:

> "The vast majority of these organisms (bacteria) are not pathogenic; most are harmless and many are indispensable aids in natural operations important to man."

"Conn, Agricultural Bacteriology (1901):

> "The more they (bacteria) have been studied the

more evident has it become that they perform other important functions in nature besides that of producing disease; that indeed the production of disease is really only a comparatively rare property, possessed by a few of the numerous species of this group of organisms" (p. 19).

"Dr. Heinemann, 'Cold Storage Problems,' Popular Science Monthly for August, 1912:

"It must not be assumed, however, that the presence of many millions of bacteria is necessarily injurious to health. Of all species of bacteria known to science an exceedingly small number is injurious, and these are rarely found in eggs" (p. 156).

"Burnet, Microbes and Toxins (1912):

"Life without microbes is not conceivable at the present day" (p. 2). "But it is the bacteria which keep up the supply of organic matter which forms the source of animal and vegetable life; it is the bacteria which restore to circulation those elements which were for a moment arrested in the bodies of animals and plants; they restore to life matter which had ceased to live. * * * Their activity is as universal as that of water, as that of light" (p. 4).

"Conn, Agricultural Bacteriology (1901):

"It has appeared that these micro-organisms play a very fundamental part in the processes of nature; that the life phenomena of animals and plants are so inextricably bound up in the functions of bacteria that without them life processes must soon cease" (p. 20).

"Many varieties of bacteria have been studied and described but most varieties have not yet been classified or described. Each variety has its own laws of life and action, its own power for good or evil, its own preferences for food conditions, its own products and its own rate of multiplication. What is meat to one is poison to another; to some, light or oxygen or acids are a necessity and to others they are fatal. Pathogenic microbes have been studied most, and some, like the cholera microbes, are fatal if swallowed but harmless if injected; while the contrary is true of the tetanus and anthrax germs. The varietal differences are so great that unless it is shown what varieties are in question, no conclusions can be drawn with regard to their activity or their products.

> "Thus Prof. Jordan testified (p. 207), that without knowledge of the number and kind of bacteria, it is impossible to say what effect the growth of bacteria would have upon an egg substance. Savage, Milk and the Public Health (1912), at page 48, shows that the enormously varying multiplication of bacteria in milk is largely due to the varieties of bacteria present in the samples.
>
> "Park, Pathogenic Bacteria and Protozoa (1908), at p. 29, says: "In judging the effect of heat as well as other agents on bacteria we have to note the important fact that different species are differently increased by the same substance. Some bacteria live under conditions which would destroy others, and they vary among themselves in their powers of resistance to influences which are deleterious to all. Further, any species of bacteria will be more resistant when under favorable conditions than under unfavorable conditions."

"Bacteria, according to their kind, require for their life and growth and development exact conditions of temperature, light, moisture, oxygen supply and food supply, and they are influenced or controlled by the presence of other bacteria and of various chemical substances.

"Jordan, General Bacteriology (1908), p. 67:

> "Various physical and chemical agencies affect profoundly the vital phenomena of all living cells; physical and chemical factors determine inexorably whether a micro-organism shall thrive and multiply; whether it shall lead a merely dormant existence or shall altogether perish. Among the most important of the natural environmental influences are temperature, light, moisture, oxygen supply, and food supply."

"Prescott and Winslow, Water Bacteriology (1908), p. 1:

> "Probably no organisms are more sensitive to external conditions and none respond more quickly to slight changes in their environment. Temperature, moisture, and oxygen are of importance in controlling their distribution; but the most significant factor is the amount of food supply."

"Very high temperatures kill bacteria and destroy their products, and very low temperatures render bacteria inert and finally kill them. This is the basis of sterilization by heat, for a moist temperature of 100° C. destroys practically all bacteria and their products, including almost all pathogenic bacteria, and indeed a temperature of 60° C. kills all bacteria and their toxins which are harmful if taken through the mouth. The effect of low temperatures is the basis of cold storage methods of preservation (Dr. Bacon, p. 73; Dr. Stiles, p. 109).

"Savage, Milk and the Public Health (1908), p. 374.

"Park, Pathogenic Bacteria and Protozoa (1908), p. 30.

"Conn, Agricultural Bacteriology (1901), p. 216.

"Most bacteria, including B. coli, cause carbo-hydrates to ferment and in the process produce acids such as lactic acid and acetic acid, and these acids inhibit putrefactive decomposition.

"Herter, Bacterial Infections (1907), p. 215, says that the principal acids formed by fermentation are lactic acid and acetic acid.

"Burnet, Microbes and Toxins (1912), says that in the presence of B. coli the growth of B. putrificus, which is the agent of putrefaction, is inhibited 'because it can only develop in an alkaline medium and the B. coli produced from the sugars of the food materials an abundance of acid. The idea of an inhibiting action exercised by an acid producing bacterium on the putrefying organism is correct' " (p. 41). "Almost all bacteria refuse to grow except in an alkaline medium" (p. 75).

"Park, Pathogenic Bacteria and Protozoa (1908):

"Most bacteria grow best in those (media) that are slightly alkaline or neutral to litmus" (p. 27). "According to Theobald Smith, all anaerobic or facultative anaerobic bacteria form acids from sugar" (p. 89), B. coli being a faculative anaerobe. "Acid Production from Sugars by Colon Bacilli—When sufficient sugar is present the amount of acid produced is quite uniform, proceeding, as a rule, until the acidity is sufficient in quantity to stop the growth of the bacilli" (p. 257).

"Generally speaking bacterial decomposition is either putrefaction or fermentation. 'Fermentation' is the bacterial decomposition of carbo-hydrates, with the production of acids and other useful or harmless substances; putrefaction is 'the decomposition of protein substances by microbes and their ferments, with the production of gas, foul smells, and sometimes poisonous substances" (Burnet (1912), p. 303).

"Herter, Bacterial Infections (1907), says: 'I shall use the word "fermentative" to designate the decomposition of carbo-hydrates and food substances and the

> word "putrefactive" as applied to the cleavages of proteid and allied substances,' and he says further that the products of fermentation are generally non-poisonous, while the products of putrefaction often exert toxic effects (p. 214).
>
> "Kendall, 'Activity of Bacteria in Intestinal Tract,' Journal Medical Research, Vol. 25: 'In reality fermentation and putrefaction are generic terms indicating respectively microbic activity upon two entirely distinct types of organic compounds, the carbo-hydrates (and closely related compounds), and nitrogenous bodies. * * * The essential feature, the action of yeast upon carbo-hydrates to form alcohol, is a typical example of fermentation' (p. 138). 'We recognize alcoholic, lactic, acetic and other fermentations' (p. 139). 'The necessity of distinguishing sharply between fermentation and putrefaction is by no means an academic one; the two phenomena are fundamentally different and diametrically opposed' " (p. 144). This distinction is recognized in popular speech.

"In the process of their growth and multiplication bacteria 'split up' or 'break down' molecules of the surrounding medium, thus decomposing that medium in a technical sense and producing products which are generally useful or at least harmless and sometimes injurious.

"Conn, Agricultural Bacteriology (1910):

> "All bacteria likewise produce a certain amount of decomposition of the materials which serve then as food, giving rise to simpler products as excretions. But while all bacteria thus perform both types of chemical change, some classes give rise, as the total result of their life, to a marked decomposition of complex bodies. * * * In some cases the new products which arise are of the nature of *excretions*. By this is meant that certain substances are taken into the bacteria and then subjected to a series of changes

> within their bodies. * * * But in other cases the new chemical bodies are apparently produced entirely outside of the body of the bacteria, and are not in any sense excreted products. It is, for example, quite certain that the alcohol which arises from the fermentation of sugar is not an excretion of the yeast cell" (pp. 37, 38).

"The testimony in the case was clear and undisputed to the effect that bacteria by their processes of growth, and not by their mere presence, cause a splitting up or breaking down of the surrounding medium and that this splitting up or breaking down is bacterial decomposition in its technical sense. (Dr. Pease, p. 201; Prof. Jordan, p. 207; Prof. Winslow, p. 210; Prof. Keith, pp. 223-224; Prof. Sedgwick, p. 246; Dr. Rosenau, pp. 228-229; Dr. Stiles, p. 51; Dr. Rosenberger, p. 30).

"The mere presence of bacteria in any numbers whatever, does not prove even the existence of technical decomposition, much less the amount of that decomposition.

"Bacteria can and do live without working or growing or multiplying when the conditions are unfavorable, and it is only when they grow and multiply that they split up or decompose the medium in which they live. This was proved by Dr. Pease at page 202 where he says, 'the growth of certain forms of bacteria, if carried far enough, would produce decomposition of the egg substance'; at page 207 Professor Jordan gives similar testimony, and Professor Winslow at page 210 and Professor Sedgwick at page 244 testify to the same effect and it is not disputed. Indeed there may be much growth and multiplication of bacteria without any material decomposition of the medium, for an infinitesimally small amount of material will furnish food for growing bacteria, and under proper conditions certain varieties grow and multiply largely without any more decomposition than is necessary for food purposes. Thus Prof. Kendall ('Activity of Bacteria in Intestinal Tract,' Journal of Medical Research, Vol. 25, p. 140), points out that the nitrogenous food requirements of bacteria are so very limited that the resulting decomposition is usually not recognized when bacteria are fermenting carbo-hydrates.

"The life, growth and development of bacteria depend absolutely upon conditions of temperature, light, moisture, oxygen supply and food supply, and the presence of other bacteria and of chemical substances, as we have shown above. A change in any one of these factors means a material change in the rate of bacterial growth and in the amount of the splitting up or decomposition caused by its growth; and whether it be a question of determining what decomposition will take place or has taken place, all the factors of the problem must be stated. If one should state to a bacteriologist that a cubic centimeter of a certain egg substance contained 100,000 bacteria and should ask him to tell how much splitting up or decomposition would result *at the end of an indefinite time*, the question would be obviously absurd; and to determine what decomposition has resulted from the *past* action of bacteria, it is equally necessary to state what varieties have been acting and for how long and under what conditions. Indeed the mere presence of bacteria in any numbers does not prove even the existence of decomposition, except possibly in the strict technical sense by which the breaking down of a single cell means decomposition; for *non constat* but that the bacteria may have come in dust immediately before the test, or in the case of a frozen product immediately before freezing.

"There is no magic or mystery about the matter; decomposition is not a function or quality of bacteria and the bacterium is not a function or quality of decomposition.

The two words are not synonymous and the two things are not connected in any way except that bacteria may and often do cause decomposition by attacking the molecules of the medium."

In addition to the foregoing citations from scientific authorities on the subject of bacteria in general, attention is particularly requested to the following statements by Archibald Robinson Ward, Assistant Professor of Bacteriology and Director of the State Hygienic Laboratory, University of California, in his manual of milk and dairy inspection, entitled Pure Milk and the Public Health, published in 1909, showing, as they do, that notwithstanding previous views in the premises, the claim that the healthy udder of the cow is sterile can no longer be held:

> "Milk comes in contact with bacteria in the lactiferous ducts of the udder at the moment of secretion. The normal healthy udder of the cow harbors bacteria throughout its whole extent. * * *
>
> "There was current at one time a belief that the interior of the udder is sterile, except, perhaps, the teats, and that failure to obtain sterile samples of milk was due to contamination from bacteria in the teats, or from external sources. Moore (41) suggested the method of attacking the problem by the bacteriological examination of the normal udders of recently slaughtered cows. The results obtained by this method of investigation (42, 44, 66, 67) diametrically opposed current belief and have led numerous workers to repeat the experiment (5, 25, 27, 28, 47). The conclusions drawn from this line of work have been in substantial agreement upon the point that milk is contaminated before it reaches the teats." (Pages 1-2.)

> "The presence of bacteria within the udder constitutes an obstacle to the production of absolutely sterile milk. v. Freudenreich collected samples, with aseptic precautions, at the beginning, the middle and

the end of the milking, determining the number of bacteria present. The average results of 185 determinations gave for the beginning, 6505 per cc.; for the middle, 1341 per cc.; and for the end, 769 per cc. Kuntze (Ref. 22, Chap. II) obtained an average of 419 per cc. from 40 samples of freshly drawn milk taken at different times during the year. Some very careful American work has shown that the contamination of the whole milking, mostly from within the udder, may vary from 200 per cc. to 900 per cc., depending upon the cow, the average being about 500 per cc. The methods of aseptic production of milk have reached such a point of refinement in some dairies that the bacteria unavoidably introduced from the udder constitute the bulk of the bacteria present in the product when bottled. The occurrence of micrococci and sterptococci in milk in the udder is a circumstance that certainly cannot justly be attributed to carelessness in milk production." (Page 4.)

"The very first stream of milk from the teat has been found to contain from 1,000 to 50,000 bacteria per cc. (26). The average of 70 experiments by Conn (10) gives 6,900 per cc. The recognition of the fact that the first streams of milk drawn contain more bacteria than that drawn later suggested the practice of rejecting the first stream or so, to lower the general bacterial content of the milking. A separate vessel is sometimes provided to avoid the necessity of drawing this foremilk upon the floor of the stall. The whole of the milk contains more or less bacteria and the contamination from the first milk drawn has little effect upon the general average. It has been shown that the rejection of three streams from each teat reduces the bacterial content of the whole milking by 4 per cent., an amount practically negligible (60). The rejection of the foremilk is practiced much more generally than is necessary, for there are few dairies indeed where the contamination from the foremilk is a noticeable factor as compared with that from other sources. This detail is

> a survival of the time when it was universally believed that the contamination in milk as drawn was derived from the orifice of the teat." (Page 5).

Apart from what is hereinabove set forth, there are other most important considerations strongly persuasive, and indeed convincing, that the Food and Drugs Act was not intended to apply, and does not apply, to the case of bacteria in milk.

1. Man has for centuries been freely using milk, containing not merely as many bacteria as at present, but vastly more, owing to the much less cleanly methods of collecting and distributing the product which have heretofore obtained.
2. The application of the act to such case, if not practically prohibitive of anything like a regular industry in supplying milk to the consumer, would, owing to the increased cost of collection, handling and distribution, greatly restrict its use.
3. There is no known standard whereby to determine how many bacteria of what kind soever in milk would render the product unsuitable for consumption—in other words, there is no test in accordance with which a danger line may be drawn in respect of the presence of bacteria in milk.
4. If required to be subjected to the necessary processes to insure freedom from bacteria, milk would be of much inferior quality, owing not only to the fact of its having been through such processes, but also to its greater age when served.
5. The consumer now has at his own command, by the simple process of boiling, the means of protection against the supposed dangers from the bacteria found in milk.

A milk dealer having on hand a quantity of milk and wishing to take the precaution of seeing that it does not get to market containing an undue quantity of bacteria, would have to have it analyzed, and it would take about 24 hours anyhow to determine whether the milk contains the suspected bacteria which are the object of the search. (Rec., 13, fol. 23.) And, manifestly, to insure safety to themselves in handling milk, the producer and distributing dairyman would each be under the necessity of maintaining a bacteriological laboratory, a condition simply forbidding the supply of milk to the average consumer because of the increased cost involved.

Besides, the necessary double examination of the milk, and its incidental and unavoidable prolonged retention in storage, would withhold its delivery so that no milk under at least three or four days old could reach the consumer, a condition making certain the loss of great quantities through souring, notwithstanding every precaution that might be taken, and making such a thing as really fresh milk for the consumer impossible, it being the accepted opinion that milk should reach the consumer within thirty hours after production.

Nor is it an answer to this to say that dairy conditions may be made such that milk may be produced at the dairy free from bacteria; for granting this to be true—doubtful as it is—it affords no guarantee to the city distributor that some bacteria were not originally in the milk, or that some may not have entered it since its leaving the dairy, and so, in order to protect himself, he would be obliged to resort to examination for himself; and the added cost of the maintenance at the dairy of the necessary highly superior conditions of cleanliness and hygiene to insure bacteria-free milk, when added to the distributor's expense attending examination, would in the end bring the cost of the milk to the consumer up to the same excessive and frequently prohibitive figure. And, moreover, the unavoidable result would be to drive many dairymen and dealers out of the business, thereby greatly restricting the source of supply and distribution of milk, to the great disadvantage of the consumer.

As respect B, coli being normally present in the intestinal canal of the cow, it is simply a condition which science has not been able to eliminate (Rec., 5, fols. 7-8); and there is no way known to science to get bacteria out of market milk except by the use of disinfectants or by sterilization, the effect of which is simply to kill the bacteria, leaving them in the milk, dead. The same is true of boiling milk (Rec., 3, fol. 5; 21, fol. 36; 25, fol. 43).

To say that the Food and Drugs Act was intended to apply, and applies, to the case of milk, merely because it contains bacteria, is therefore to say that, without a word in the Act to that effect, either direct or indirect, it was the intent of the Act to revolutionize the manner and methods of collecting, handling and supplying milk, and that, too, without even pointing to any standard or test in respect to the quantity of bacteria that may safely be allowed in the product; with the effect of greatly limiting its supply and distribution, enormously enhancing its cost, and in a great degree prohibiting its use. It may safely be asserted that there is no precedent for the accomplishment by indirection of results so momentous and revolutionary in any industry of what kind soever.

Respectfully submitted,

HENRY E. DAVIS,
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COURT OF APPEALS
DISTRICT OF COLUMBIA
FILED
DEC-30-1912
Henry W. Hodges
Clerk.

IN THE

Court of Appeals, District of Columbia.

OCTOBER TERM, 1912.

No. 16 Special Calendar
January [illegible] 1913

No. 2466.

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CHARLES G. DADE, Plaintiff in Error,
vs.
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IN ERROR TO THE POLICE COURT OF THE DISTRICT OF COLUMBIA.

BRIEF ON BEHALF OF THE UNITED STATES OF AMERICA.

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Judd & Detweiler (Inc.), Printers, Washington, D. C.

No. 4 Special Calend
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The assignments of error will be considered as grouped in brief for plaintiff in error.

Assignment of error A relates strictly to the word "consist" as it appears in the sixth paragraph of section 7 of the Food and Drugs Act, approved June 30, 1906, the information being in the language of the statute, namely, that the said food was adulterated "in that it did consist in whole and in part of a filthy, decomposed, and putrid animal and vegetable substance." The distinction sought to be drawn by the plaintiff in error, hereinafter referred to as the defendant, is that even though the court below found from the evidence that the food product offered for sale was made up in part of and contaminated with certain filthy substances, yet the act did not apply, because the constituent parts of the product itself were not of themselves filthy, but that the resultant article contained them. We respectfully submit that such a contention is without merit. This statute was passed in the interests of the public (United States *vs.* Morgan, 222 U. S., 281), and was intended to protect the public from impurity in foods, no matter how contained therein, and from frauds in connection with their sale. It is therefore a remedial statute and is to be fairly and reasonably construed so as to carry out the intention of the legislature (U. S. *vs.* Stowell, 133 U. S., 1; Johnson *vs.* S. P. Co., 196 U. S., 1, 17). Paragraphs 1, 2, 3, 4, and 5 of section 7 of the Food and Drugs Act clearly prohibit the adulteration of food products by the addition of various substances for purposes of deception, while paragraph 6 relates to products which contain filthy, decomposed, or putrid animal or vegetable substances, the prohibition in the last section being not against voluntary addition, but the existence of a condition, no matter how caused.

Admitting, for the purpose of argument, the position advanced by counsel for the defendant, namely, that the constituents that make up the resultant article of food must be filthy and decomposed, we respectfully submit that the conviction was proper, for the evidence was, and the court below so found, that the milk itself was both filthy and decomposed. It is common knowledge that, on account of its solvent powers, filth of the character here in question cannot be in milk without becoming for all practicable purposes a part of the milk itself.

Dr. John F. Anderson, a witness on behalf of the United

States, testified to his qualification as an expert witness as follows: That he is an officer in the Public Health and Marine Hospital Service and a director in the Hygienic Laboratory; has been an officer in the service since 1898, and has been a director of the laboratory for approximately three years, and has been engaged in bacteriological work almost exclusively since 1892; has made a number of studies on milk and the relation of milk to public health. He further testified, in answer to a hypothetical question—

> "that he would consider that milk, from which those analyses were made, to have been a dirty milk, especially on account of the large number of B. Coli and streptococci found, originally contained fæces and therefore was filthy; that in witness's opinion a large number of bacteria were there as a result of the multiplication of bacteria originally in it, and the growth of bacteria inevitably results in the decomposition in which it grows; that these bacteria, the two types, came from cow manure; that the milk by some means became contaminated with fæces * * * but that the large number of bacteria of that type was there as a result of the growth of those bacteria in milk * * * that he would call the milk a decomposed substance; that he would consider the milk itself a decomposed substance; that the milk is an animal substance, and the bacteria are a vegetable in the milk, and as the result of the growth of them in the milk, the milk becomes a decomposed substance. * * * When bacteria grow, they grow at the expense of the medium in which they are found * * * When they grow in milk, they grow at the expense of that milk, they split the milk up in various elements" (Rec., pp. 7 and 8).

The definition found in the various dictionaries which are submitted in the brief of defendant support the position of the Government that the product offered for sale by the defendant consisted, either in whole or in part, of a filthy and decomposed substance, in that it was composed and made up of the excreta and dejecta of the bacteria contained therein.

In United States *vs.* Nine Barrels of Olives, in the United States District Court for the Eastern District of Pennsylvania, 179 Fed., 983, where certain olives were condemned because of a filthy condition existing by reason of the presence of worms and their excreta in the olives, Mr. Justice McPherson, in the course of the definition of "filthy" and "decomposed," says:

> "You must bear in mind that these two words 'filthy' and 'decomposed' are used in this case before us with reference to food, with reference to articles that are offered for food, and, therefore, you must view the evidence in the light of the subject-matter to which your attention has been directed; because it is quite clear that a situation which might justify a jury in finding a food was decomposed might not justify them in finding that same substance was either filthy or decomposed. * * *
>
> "Now what have the witnesses said in regard to these articles? Were they filthy, regarded as articles of food? The point to which the Government directs your attention, and the only point to which the Government directs your attention, in that respect, is the alleged presence of worms and the excreta of worms, which are said to have been found in these barrels. What are the facts in that regard? I do not intend to go over the evidence at all, or to direct your attention to what any particular witness may have said. You have heard the evidence and you must determine what the facts were, to what extent worms, or the excreta of worms, were found in these olives, and, when you have determined this fact, it may justify you in finding that you can properly regard them as filthy."

We respectfully submit that the words of the statute are to receive a sensible and reasonable construction.

B. The testimony is overwhelming and at one to the proposition that the milk in question was filthy and decomposed.

The evidence in the court below did not support, nor did the court find, as a matter of fact, that the milk was putrid. so that charge may be considered out of the case.

(*a*) The argument made by counsel for the defendant in his brief to the effect that the bacteria have not been proved to be of themselves filthy is beside the question and need not here be answered further than to say no such contention was ever made by the Government. The contention of the Government is that the bacteria here in question, and the testimony is complete on that proposition, was an evidence of the filth being in the milk.

Dr. Dieter, the bacteriologist of the City Health Department and who collected and analyzed this sample of milk, testified that "it contained 4,500,000 bacteria on ordinary agar 37 degrees centigrade, grown for twenty-four hours and 89,400,000 bacteria per cubic centimeter. On ordinary agar, 25 degrees centigrade, grown forty-eight hours, it contained 83,000 bacteria per cubic centimeter, of the colon group. It showed gas fermentation in one ten-thousandth of cubic centimeter (approximately 15 drops) and one streptococcus to one ten-thousandth of a cubic centimeter The colon group of bacteria comes from fæcal contamination * * * it is not a constituent of milk. Streptococci do not come from the milk at all as it flows from the animal; it is an outside contamination. When the streptococcus is associated with colon bacillus, it is usually from fæcal contamination. As a rule the B. Coli and the streptococci are associated together in the colon. The presence of both together in substance other than fæcal matter indicates outside contamination. The streptococci are also found in diseased processes of the animal's diseased intestines and in human beings, usually in diseased conditions, boils, abscesses, and conditions of that kind" (Rec., pp. 2-4). Dr. Kinyoun, a doctor of medicine, a doctor of philosophy and also a bacteriologist, testified, "that milk containing the number of bacteria found in the sample of milk in question was both filthy and decomposed; filthy by reason of the fact that it contained those organisms that came from dung or fæcal matter, and, secondly, on account of excessive number of bacteria. The combination of the B. Coli and streptococci indicate fæcal matter or dung. It is the normal and natural state of the intestines to contain these bacteria, but not of the milk; the way they come into the milk is by allowing a lot of cow dung to get into the milk, which can be prevented by cleanly methods; we have daily instances of milk that does not contain any. There is no way which these B. Coli can get into milk before it leaves the cow. There is no instance on record of their being in milk before leaving the cow. To account for the presence of B. Coli and streptococci in milk, some one must have added cow dung. Taking the sample in question here and the quantity of the two groups, it is injurious to the human species so far as streptococci are concerned. There is no way of distinguishing between the harmless and the virulent varieties of streptococci, that is in the ordinary process of examining milk. But the studies which have been made on streptoccoci from intestines of animals show very frequently that the streptococci present are the disease-producing variety. The presence of B. Coli and streptococci indicates filth" (Rec., pp. 4, 5). Dr. Anderson, heretofore quoted, considered the milk here in question filthy, decomposed and not fit for human consumption. Carleton Bates, B. S., assistant bacteriologist in the Bureau of Chemistry of the Agricultural Department, testified that the milk was contaminated and filthy. Lore A. Rogers, B. S., after stating that he was a bacteriologist in charge of the laboratories of the dairy division of the Department of Agriculture, and previous to that, three years assistant bacteriologist in the New York Agriculture Experiment Station, and that he was familiar with various organisms found in dairy products, said that, in his opinion, the milk was collected under uncleanly conditions; the presence of the B. Coli with the streptococci indicated fæcal contamination—the bacteria themselves die and decompose in the milk—and bacteria of these two classes effect decomposition of certain products of the milk. "One of the most evident decompositions is the decomposition of milk sugar which is broken up into various gases and acids. Milk becomes decomposed through contact of the B. Coli. That large number of bacteria in milk indicated decomposition." In his opinion the B. Coli could not have gotten into the milk in any way except through contamination with fæcal matter—the streptococci might have got in through a diseased udder (Rec., 6-17).

It will thus be seen that the court's finding below upon the question of fact was in consonance with all of the evidence. There is, in the record, no evidence to the contrary. Interesting it is to note that counsel for the defendant refrained from asking his own witnesses the condition of the milk here in question, but confined his examination of the witnesses to bacteria in general and the definitions of decomposition.

As to the testimony of the witness Hird, produced on behalf of the defendant, it may be considered without the case for the reason that Hird himself stated that he was not a bacteriologist, hence not qualified to give an opinion. Dr O'Denoghue's testimony, while he was not asked about the condition of the milk in question, showed conclusively that milk properly handled would not contain this number of bacteria, that it was filthy, decomposed and dangerous to health. Witness said that the B. Coli found its way from the intestinal tract into the outer air through the excreta or dejecta; said that he had found the B. Coli in water; didn't find any fæcal matter, but admitted that it might have been there, as his determination would not of disclosed it had it been there. That there were several kinds of streptococci, streptococcus fæcalis, found in the intestines of cows and also sometimes in human beings, streptococcus pyogenes, found in blood poisoning, streptococcus erysipelatis, found in erysipelas and streptococcus lacticus found on the skins of animals. There is no way of differentiating one from another. According to the best of authorities, milk taken under aseptic conditions from the cow will contain from 200 to 400 bacteria to the cubic centimeter. The witness had made three tests from milk freshly taken from the cow. In the first sample, when no precaution was taken, found about 300,000 bacteria to the cubic centimeter, taking simply the number of bacteria not the kind; on the second test, when the milker simply washed his hands, found about 100,000; on the third test, washed and scrubbed the udder, and the milker scrubbed his hands, found between 15,000 and 20,000. B. Coli were found in all; in the last test streptococci were absent. *Non constat,* but that he made another test with cleanly surroundings, the B. Coli would have been absent and the number of general bacteria much lower. However, enough is here shown to convince the court that milk containing the large number of bacteria here in question, to wit, 4,500,000 bacteria per cubic centimeter, after twenty-four hours incubation, 83,000 of which were B. Coli and 10,000 of which streptococci, was filthy and decomposed. Witness being asked if he would recommend this milk to be given to a child, said that he would not recommend milk at all to a child unless it was pasteurized. Doesn't know whether milk containing B. Coli and streptococci is harmful. Would not recommend any milk but sterile, because other milk is liable to have some pathogenic germs in it. Then was read from Jordan's work produced on and in behalf of defendant the following:

> "It is well established, however, that under some conditions the colon bacillus is able to pass from the digestive tract into the blood whence it may invade the gall bladder and bile ducts and cause cholangitus and cholectystitis.
>
> "Convincing evidence on this score has been obtained from human pathology and from animal experiment. The bacillus is often found in the core of gall stones. Kramer has made the interesting observation that in cultures the colon bacillis (and the typhoid bacillus) can precipitate cholesteri and other biliary constituents and hence may take an important part in gall-stone formation" (Rec., pp. 20-24).

The court below, acting in its capacity as a jury, found from the foregoing evidence, that the product of food here under discussion was filthy and decomposed and it is therefore submitted that this court will accept the findings of fact of that court.

We contend that the words filthy, decomposed and putrid as used in paragraph 6, have their ordinary meaning, and include any article of food which would be regarded by the average person acquainted with the facts as filthy, decomposed, or putrid, irrespective of its wholesomeness.

Filth is defined in the Standard Dictionary as anything that soils or makes foul or dirty.

Decomposed—to resolve or separate into constituent parts or elements, as by means of chemical action, or by natural decay, especially to cause to decay or rot.

Putrid—bearing signs of or produced by putrefaction, as putrid smell; being in a state of putrefaction; tainted, as putrid flesh.

To putrefy—to cause to decompose or decay with fetid odor.

These words in the statute are used in the disjunctive, and if any article of food falls within the definition of either one of these words it is condemned by the act. An article may be filthy without being decomposed or putrid. As, for instance, worms and bugs in sauer-kraut or pickles—decomposed—without being putrid. It will hardly be contended even by counsel for the defendant, that a rotten apple is not condemned by the statute.

That no such construction is to be placed upon the word decomposed as is sought to be given it by counsel for defendant in his brief, and that Congress used it in its ordinary sense, is made clear by the decision in the case of The U. S. *vs.* Nine Barrels of Olives, 179 Fed., 983, *supra.* Mr Justice McPherson, in the course of the definition of "filthy" and "decomposed" said:

> "You must bear in mind that these two words 'filthy' and 'decomposed' are used in this case before

> us with reference to food, and, therefore you must view the evidence in the light of the subject-matter to which your attention has been directed; because it is quite clear that a situation which might justify a jury in finding a food was decomposed might not justify them in finding that some substance was either filthy or decomposed."

In the Frozen Egg Product case, so called, which was decided by the Circuit Court of Appeals for the Third Circuit, U. S. *vs.* 43 Cans of Frozen Egg Product, 193 Fed., 589. lately before the Supreme Court of the United States, but which went off on a jurisdictional question, the court there, addressing itself to the word "decomposed," said:

> "Finding, therefore, that this food product was decomposed, and the act providing that for the purposes of the act an article shall be deemed to be adulterated, if it consists in whole or in part of a filthy, decomposed, or putrid animal substance, it follows that this product falls within the statutory definition on the ground of decomposition and it therefore becomes unnecessary for the purposes of this case to pass on the question whether the product, by reason of the addition of sugar, was adulterated."

Thus it will be seen that the Circuit Court of Appeals gave the ordinary and sensible definition to the word decomposed

Respecting that part of the brief of counsel for the defendant taken from the so-called Frozen Egg Product case. *supra,* all that need be said is that it is very enlightening, but it has no relation to the case at bar, because it is merely a dissertation upon bacteria in general. One or two quotations therefrom will suffice to illustrate the point. Page 38 of brief of counsel for defendant quotes Burnet, Microbes and Toxins (1912), page 55:

> "Microbes are of all living creatures the most widespread. They exist wherever there is organic matter" (p. 50). "The term microbes in current language most frequently signifies bacteria. * * * Scattered as they are throughout nature the bacteria are the chief agents in the decomposition and recombinations of organic and living matter."

On the same page Prescott & Winslow, Water Bacteriology (1908), page 1:

> "Bacteria are the most numerous and the most widely distributed of living things. They are present not merely at the surface of the earth or in the bodies of water which partially cover it, as is the case with most other living things, but in the soil itself and in the air above and in the waters under the earth."

Pages 39-40, Conn, Agricultural Bacteriology (1901):

> "The more they (bacteria) have been studied the more evident has it become that they perform other important functions in nature besides that of producing disease; that indeed the production of disease is really only a comparatively rare property possessed by a few of the numerous species of this group of organisms" (p. 19).

Pages 44, 45, Conn, Agricultural Bacteriology (1910):

> "All bacteria likewise produce a certain amount of decomposition of the materials which serve them as food, giving rise to simpler products as excretions. But while all bacteria thus perform both types of chemical change, some classes give rise, as the total result of their life, to marked decomposition of complex bodies. * * * In some cases the new products which arise are of the nature of excretions. By this is meant that certain substances are taken into the bacteria and then subjected to a series of changes within their bodies. * * * But in other cases the new chemical bodies are apparently produced entirely outside of the body of the bacteria, and are not in any sense excreted products."

This case is not an attack upon the milk industry of the District of Columbia.

It is simply a prosecution of a milk dealer under the law for selling adulterated milk. If the findings of the lower court be upheld by this court it does not follow that the milk industry is to be seriously affected, but it simply means that filthy and decomposed milk should not be hereafter offered for sale or sold.

The contention of counsel for defendant to the effect that if this conviction be upheld that the milk industry will be revolutionized and that the cost of milk will be practically prohibitive, and the inevitable result will be to drive the dairyman and dealers out of business, is not supported by the evidence. If it is meant by revolution that more cleanly methods are to be used in handling milk by some dairymen and dealers, we concede the contention and say the sooner it comes the better. The evidence here is that the B. Coli and streptococci are foreign substances and by using cleanly methods milk will be free from such bacteria.

Kenyoun (Rec., p. 5), referring to the B. Coli:

> "The way they come into the milk is by allowing cow dung to get into the milk, which can be prevented by cleanly methods; we have daily instances of milk that does not contain any."

Dr. Anderson to the same effect (Sec. 9). Also Bates and Rogers. Dr. Dietur, supported by his records, on page 15 of the record, of milk examined by him during 18 months. approximately 1,200 samples, the percentage containing B Coli was about 48 per cent of the total number of samples analyzed, so that 52 per cent was free from the B. Coli.

It is respectfully submitted, therefore, that the whole evidence in the case shows that, as found by the police court, the milk here in question was filthy and decomposed.

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